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Author(s): Ron Westrum
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Social Intelligence About Anomalies: The Case of UFOs

Ron Westrum

In recent years, there has been considerable public interest in the possible existence of certain controversial anomalies and their implications. These anomalies include the Loch Ness Monster, the Abominable Snowman and his American Relative the 'Bigfoot', and Unidentified Flying Objects. The interest in anomalies has accompanied a revival of interest in the occult[1] and in certain scientific fringe theories such as those of Immanuel Velikovsky.[2] The public has turned to scientists in many of the cases to validate or debunk the claims made by advocates of anomalies, occult beliefs, and fringe theories. Scientists in turn, alarmed by the rise of these types of interests, have attempted to deny legitimacy to these claims on various grounds.[3] This debunking posture on the part of scientists now seems so natural that scientists who become anomaly advocates appear somewhat anomalous themselves.[4]

The general debunking posture requires explanation, since one cannot simply assume that because scientists are the representatives of truth, they naturally resist such 'error' – however appealing this ideology might be to members of the scientific community. The explanation can be sought in two sets of factors, which one might call 'the interests of the scientific community' and 'the logic of scientific belief', respectively.[5] The first set of factors will not be discussed at any length here, although the author plans to do so in a later work.[6] For the moment, let us simply observe that the popularity of beliefs and belief systems which conflict with those

Author's address: Department of Sociology, Eastern Michigan University, Ypsilanti, Michigan 48197, USA.

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of the scientific community tends to threaten the latter's claim to a monopoly of true descriptions of the nature of the physical world, and the prestige given to anomalists, occultists, and fringe scientists threatens the public position of science.

But debunking also proceeds from 'internal' motives, from present scientific paradigms, theories, and established 'facts', and from the nature of the evidence that supports belief in anomalies.[7] There are 'reasons' for disbelieving that anomalies exist, both theoretical and evidential. It can be argued that 'everything we know' militates against an anomaly of such and such a kind existing. But furthermore, one can show that the evidence *for* this anomaly existing is very weak, and can be dismissed either on theoretical grounds or by showing that mis-representation or error is involved. A typical scientific article debunking an anomaly will have arguments of both types, and will show not only that there are good reasons for not believing that the anomaly exists, but also that there is very little evidence that in fact it does exist.[8]

In this paper, we will explore how scientists get this evidence, which forms such an important part of their rejection of anomalies. We will examine the social system which intervenes between those who have anomaly experiences and scientists who make decisions as to whether or not anomalies exist. We will consider the system of 'social intelligence' which transmits reports of anomaly experiences to the public and to scientists in particular. We will consider how the reports transmitted by this system influence scientists' decisions about whether to investigate these anomalies or not, and specifically how this system has discouraged scientists from investigating UFO experiences.

But the function of anomaly reports is not always negative, for sometimes the reports focus scientific attention and motivate scientific research into the anomalies in question. The controversy over the existence of meteorites, for instance, was put to rest through a research expedition motivated by exactly such reports. At a time when the existence of meteorites was just beginning to gain acceptance, an enormous fall of stones took place near l'Aigle, France in 1803. The fall created such a sensation that the Minister of the Interior asked the Institut to send one of their number to investigate.[9] They sent the brilliant Jean-Baptiste Biot (1774-1862), who promptly issued a report which confirmed the fall.[10] Biot's memoir was so convincing that few in the scientific community thereafter dared to question the existence of the stones falling from the sky.

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To examine the system of social intelligence which transmits anomaly reports, we will take as an example reports about Unidentified Flying Objects. The author is also conducting similar examinations of social information about sea-serpents and meteorites.[11] But Unidentified Flying Objects, or UFOs, can be taken in many respects as a typical case. One can easily find social phenomena in regard to UFOs which have parallels with sea-serpent reports and with meteorite reports in the pre-scientific-acceptance state. One must be careful, of course, not to press the parallels too far, since there are also considerable differences in social reaction to different anomalies. For example, sea-serpent reports early received considerable support from the scientific community, which has not been true to date of UFO reports.[12] Nonetheless, the case of UFO reports illustrates very well the dynamics of anomaly information transmission.

We will focus our attention primarily on two aspects of information about anomalies. First, we will consider the nature of the anomaly experience itself, whose features often determine whether or not it will be reported. Then we will consider how experiences become transformed into reports, and what happens to these reports as they pass through social channels. We will conclude with some observations about the reliability of decisions made on information derived from these social processes.

THE ONTOLOGICAL STATUS OF UFOs

Before proceeding further in describing social intelligence processes about UFOs, the reader may be concerned about whether the author feels these objects to be real or imaginary, and to what class of concepts, if not objects, the discussion will be limited. The label 'Unidentified Flying Objects' was originally substituted for 'flying saucers' as an attempt to be more agnostic about the phenomena in question.[13] Even the former term, however, poses difficulties. Menzel suggests that the term is a misnomer because it implies that the sightings 'are of material reality', a view to which Menzel does not adhere.[14] Objection could also be made to the word 'flying', since this assumes something about the propulsion of the phenomenon: and in any case some of the most interesting manifestations are seen on the ground. How to delimit this seemingly amorphous class of objects or events?

Both the taxonomic and epistemological problems can be solved

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if we are willing to suspend judgment on the reality of UFOs and deal with the subject in terms of psychological and social events.[15] Rather than a 'person who has sighted a UFO', we have a 'person who has had a UFO experience'. This person may then make a 'report' of his experience, although we know that in some cases there have been reports which were not based on experiences (hoaxes). Similarly, there have been experiences which did not eventuate in public reports. Again, we are interested in how experiences are transformed into reports which are transformed in turn into the 'data' on which the scientist at least partly bases his decision about the reality of UFOs.

The reader may feel nonetheless that study of the social events associated with a supposed anomaly may generate indications as to whether the anomaly exists or not. In the next section we will see that there are indications that some witnesses have perceived genuinely anomalous objects, at least in terms of ordinary rules used in our culture for assessing the validity of experiences. However, we must recognize that the rules by which some objects are considered real or not is also a potential object of study,[16] and that other cultures might well recognize other rules. Rather than become entangled in the controversy over whether UFOs pass our cultural tests for reality or not,[17] let us focus our attention instead on the processes by which we get the data which allow us to make such a decision.

THE UFO EXPERIENCE

How does a person come to decide that he is having a UFO experience? Clearly this is a critical question, both in terms of the person communicating his experience to others and in terms of the experience being compared to other, 'similar' experiences. In the first place, it is possible that the individual may not define the experience as 'UFO' during the experience at all, in the sense that the object experienced is recognized as being one of a class of 'UFO objects'. He may feel that he is having an experience with an anomalous object, and his experience may be reported for this reason, even though it is not clear to what class of objects the experience belongs. Previous to 1947, for instance, when the phrase 'flying saucers' was first used, those who had what would now be classified as UFO experiences could only describe them in very specific terms, as they were unaware that others were having similar experiences.[18] The event may thus be

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labelled a 'UFO experience' only a considerable time after the event itself. This can happen when the person discusses his experience with others or even after the report has been made and is being compared to other reports. At the time, the person may simply feel that the experience is anomalous because it does not fit into any conventional cultural categories.

On the other hand, once the social category 'UFO' exists, it is possible to imagine the event in advance of the actual experience. There would thus exist a number of perceptual cues which would be seen as indicative of a UFO experience.[19] There may even be a strong psychological set on the part of some individuals toward perceiving ambiguous stimuli as UFOs. Consider the following account:

> I really wanted to see a UFO. I remember saying aloud. . . . 'This is no natural phenomenon. It's really UFOs', I . . . made an attempt to communicate with them. I had a flashlight . . . and signaled . . . in Morse code. . . . No visible response elicited. . . . After I came into the house I had an overpowering drive to sleep. . . . My dog . . . went over between the two trash cans like she was frightened to death. . . . High frequency sound inaudible to us?[20]

It is ironic that the stimulus for this experience may have been the debris of the Russian satellite Zond IV re-entering the atmosphere.[21]

Not all those who have UFO experiences achieve the perception so easily. In many cases the perception of a UFO comes only after several other perceptual 'hypotheses' have been tried out and found wanting. Only the failure to make any of the non-anomalous hypotheses 'fit' the stimulus leads to a perception of an anomaly:

> The object looked like the top of a parachute canopy, he told me; it was white and he thought he could see the wedges of panels. He said that he thought it was moving across the ground a little bit too fast to be drifting in the wind, but he was sure that somebody had bailed out and that he was looking at the top of his parachute. He was just ready to call the tower when he suddenly realized that this 'parachute' was drifting across the wind.[12]

In another case which the author investigated, a merchant and his daughter saw what he thought at first were the windows of an airliner in the sky above his father's home. But he rejected this idea when he realized that the 'airliner' was not moving. Was it a helicopter then? This idea also had to be rejected, as the witness reported hearing no sound. Finally the object appeared to be a 150-foot wide disc perhaps some 800 feet off the ground, with portholes 'like the windows

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on an airliner'. After eight or ten minutes, the object departed slowly to the northwest.

This 'escalation of hypotheses', as Hynek has called it,[23] is a typical feature of many anomaly sightings. It is, according to one theory of perceptual recognition,[24] the way one would expect the human perceptual apparatus to operate if indeed it were to encounter an object which it had great difficulty recognizing. The relative slowness in perceiving an anomalous object would be the result of attempting to match the stimulus with more common perceptual ideas first. If an object is rare or 'impossible' (such as a red ace of spades), it will be perceived for what it is only with great difficulty.

Another possible indication that the subject of an anomaly experience is indeed perceiving an anomalous object correctly is the existence of critical reactions to the perception. In his study of public reactions to the Welles' 'Invasion from Mars' broadcast of 1937, Cantril found that belief in the 'invasion' was caused by lack of what he called 'critical ability'.[25] Briefly, critical ability was shown by those who made effective checks about the authenticity of the described events either through the internal evidence of the broadcast itself or by checking the social context for counter-indications, such as routine programmes on other radio channels. Those without this critical ability, even when they were of a relatively high educational level, believed that the play was indeed a news broadcast, that the Martians were actually landing, and so on – except in the case of those who were lucky enough to find out by accident that the broadcast was a play.

In UFO experiences, one also finds some witnesses who feel that critical checks on their own perceptions are necessary to validate them. For instance, a group of scientists who thought they might be mistaking airplanes near their installation for UFOs had planes fly over to see if they produced the same effect.[26] Still other ways to make sure that one is seeing something correctly are to ask someone else if they can see it as well;[27] or once one has left the locale of the sighting, to return to it to see if the object is still there:

> I wanted to make *sure* it was there. To take another look to make sure I wasn't seeing things. We did go back.[28]

If the person who has an anomaly experience is to make public witness of his experience, he must be sure that he has indeed seen something anomalous. Having made critical checks is likely to enhance this certainty, but he must also be confident that he can discriminate

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an anomalous stimulus from a non-anomalous one. In one survey, for instance, persons who had not reported their UFO experiences most frequently (forty percent) claimed as the major reason for their non-reporting that 'it was probably something normal that just looked funny for one reason or another'.[29]

One could say a great deal more about the internal constitution of anomaly experiences in general and UFO experiences in particular, but hopefully this brief summary will give the reader some feeling for the nature of UFO experiences.[30]

THE SOCIAL DISTRIBUTION OF UFO EXPERIENCES

How are UFO experiences distributed in society — or rather, in different societies? This is a very difficult question, and we can only begin to answer it for the United States, where a number of random-sample public polls including questions on UFOs have been made. Only random-sample polls are very useful in dealing with the question of overall distribution, although up to this point they have included very few of the many questions which would be of interest to the sociologist of knowledge. The most important question, which has been included in all surveys bearing on the issue, is of course 'Have you ever seen a UFO?' The phrasing of this question has varied from one poll to another, but the answers tell us to a certain extent how often and by whom UFOs have been seen in the United States.

In 1966, a national Gallup poll indicated that five percent of the American adult population had seen something they thought was a 'flying saucer'.[31] A 1968 study by the University of Colorado, which used the words 'Unidentified Flying Object' instead of 'flying saucer', found that three percent of the population claimed to have seen a UFO.[32] In 1973 a Gallup poll, this time using the word 'UFO', found that eleven percent of the population claimed to have seen a UFO.[33] The implication of these percentages is that by 1973, something like sixteen million adults in the United States believed themselves to have had UFO experiences.

What sectors of the population are most likely to have UFO experiences? A commonsense hypothesis about anomaly perception is that experiences of this kind are the result of some sort of pathological condition.[34] One might then expect UFO experiencers to be mentally ill, socially marginal, or deviant in one way or another.

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While one can test few of these traits directly with survey data, analysis of the 1973 Gallup poll responses suggests that in most ways UFO experiencers are not very different from the general population.[35] In occupation, education, religion, and political attitudes, there is no significant difference between those with and without UFO experiences. But young people are much more likely to have had UFO experiences than older people; and males have more UFO experiences than females, especially black males versus black females. In terms of residence, UFO experiencers are more likely to reside in smaller towns (10,000-25,000 people) than in rural areas or larger cities.

Using the 1966 Gallup poll data, Warren[36] studied the relationship between UFO experiences and the consistency of status ranks for a given individual. If a person's income, occupation, and education are all high, all medium, or all low, he can be described as a status consistent. When the person's rank on some of the variables is different from his rank on others (say high education with a low income), he is referred to as a status inconsistent.[37] Warren argued that status inconsistents were more likely to be UFO experiencers. His data, however, support this assertion only in an extremely qualified way, and in any case the majority of UFO experiencers are not status inconsistents. In a later study, Warren shows that inconsistency is less important than general status level, which is positively correlated with UFO experiences.[38] Warren's attempt to present the UFO experiencer as a status-inconsistent, and therefore marginal, individual thus fails.

But perhaps survey data of the Gallup poll type is simply too insensitive to the relevant variables. If one made a more specialized study of UFO experiencers, more significant trends might come to light. Unfortunately, the few field studies which have been done on UFO experiencers have been done by UFO advocates whose field of expertise is not sociology. Still, the conclusions of these studies are interesting, since they tap sources of data which are not available in large national random samples like the Gallup polls. Vallée and Vallée, in an analysis of the French 'wave' of experiences in 1954, found that those who reported experiences with low level 'objects' tended to live in rural areas, to be respected in their communities and to hold steady jobs. Only fifteen percent of the experiences took place with a single individual; the rest involved multiple 'witnesses'.[39] A later study by Vallée and Olmos, on Spanish low-level cases, bore out these conclusions, and further suggested that low-level UFO

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experiences tend to take place when the experiencer is engaged in routine activities.[40] These studies seem to reinforce the image of UFO experiencers as non-deviants.

The question of psychopathology in UFO experiencers is a persistent one, and it is of interest that at least one psychiatrist has written at some length on the UFO experiences of his patients. After stating the rarity of such experiences among the mentally ill population, Schwarz discusses the UFO experiences of several neurotic patients.[41] He feels that pathologies exhibited by these patients have no relation to their UFO experiences, except that the experiences, because they are difficult to relate to others, make it harder for the individual to relate to society. Schwarz's evident *parti pris* on the UFO questions, however, would make the replication of his observations by others very desirable. Nonetheless, it is encouraging to see psychiatrists actually investigating UFO cases, rather than merely theorizing about the causes of these 'hallucinations' or 'delusions' in an a priori fashion.[42]

Still another approach is that taken by Saunders, who has compiled a computerized catalogue which includes over 80,000 reports of 'sightings'. Saunders attempted to discover, through analysis of the demographic features of the countries in which reported UFO experiences have taken place, which features correlate with a high rate of UFO sightings per county. Not surprisingly, he has found that counties with more land and more population have more sightings, and also, that a higher educational level correlates with more sightings.[43] Such findings, however, suffer from the usual problems of 'ecological' correlations;[44] and without case-study data as well, it is difficult to know how to interpret them. For instance, it is not clear whether a higher educational level of the population contributes toward having more UFO experiences, or simply improves the probability that they will be reported once they take place.

A general problem in trying to discover the relation between UFO experiences and the characteristics of the experiencer is the gap between random-sample studies and studies of reported UFO experiences. The former, while giving a better idea of the relation of UFO experiencers to the general population, tend to be relatively insensitive to many personal characteristics which such surveys are ill-designed to examine. Field studies of UFO experiencers, on the other hand, often give much more information about the individual; but they are likely to suffer from lack of representativeness. For the social intelligence system is likely to work, as we shall shortly

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see, in such a way that reporters are not a random sample of experiencers. Field studies are more likely to concentrate on spectacular, 'credible' cases to the detriment of less interesting and less credible ones, since social filtering mechanisms are more likely to pass on the former than the latter.

The social intelligence system is affected, however, by social beliefs about the population of UFO experiencers. If certain categories of individuals, felt to be particularly reliable as witnesses by society, do not have UFO experiences, then these experiences will be processed in a different way than would be the case if the 'reliable' individuals had the experiences too. A case in point is the UFO experiences of astronomers. The processing of UFO reports will proceed in one way if astronomers are thought to see UFOs, another way if they are thought not to. In this connection, it is interesting to note that an informal poll of forty-five well-known astronomers in 1953, carried out by another astronomer, revealed that six of them had seen something they could not explain.[45] And yet as late as 1968, another scientist (R.V. Jones) could write that UFO experiences were very rare among persons with a scientific training.[46] In his view, this suggests that UFOs are not real objects in the same way that ball lightning is. What society, and scientists in particular, believe about the population of persons who have UFO experiences is thus critical for the manner in which reports of these experiences will be treated by society.

THE CONTAGION OF EXPERIENCES

Another commonsense explanation of UFO experiences refers not to the pathology of the individual, but to social processes. UFO experiences, it has been proposed, are the result of 'suggestion' or 'hysterical contagion'.[47] It can be observed that the mass media report UFO experiences in large batches or 'flaps'; this yields the impression of some type of imitative behaviour on the part of UFO experiencers. How tenable is such an hypothesis?

We shall see below that the 'flap' phenomenon has another explanation, namely that a publicized report may change the parameters of the reporting process; it may thus be an artifact of the social intelligence system rather than reflecting the contagion of experiences. Even if the media were an exact mirror of social events, however, 'hysterical contagion' would still be an inappropriate concept,

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since this refers to the spread of emotional states,[48] whereas with UFO experiences, we seem to have instead a kind of perceptual epidemic. Let us consider how such an epidemic might work.

First of all, the concept 'UFO' provides a convenient label for certain bundles of ambiguous stimuli. It must also be recognized that this label is more interesting than some others which might be applied to the same stimuli, such as, say, 'airplane'. If the use of the label 'UFO' becomes semi-legitimate, one may see it diffuse through society. Stimuli which previously were interpreted in one way now receive a different interpretation. Thus one person's report of a UFO experience may trigger the experiences of others.

One example of a similar perceptual contagion was the 'Seattle Windshield Pitting Epidemic', in which the residents of Seattle, Washington suddenly began to see small pits appearing on their windshields.[49] Subsequent research suggested that the pits had always been there, but that people had never paid any attention to them. However, when it was suggested that the pits might be due to atomic radiation, an epidemic of reporting windshield pits began. Thus, stimuli which had always been present suddenly began to be interpreted and reported in a very different way.

Are UFO experiences, then, the result of an unambiguous interpretation of essentially ambiguous (and common) stimuli? Doubtless a great many are exactly that. The interpretation of moving lights in the sky, birds seen in the distance, astronomical phenomena with which the observer is not familiar, and the like, as UFOs probably occupy the bulk of UFO experiences. There are some experiences, however, in which the stimulus could be called 'ambiguous' only in the sense that every stimulus is ambiguous.[50] In these cases the viewing conditions are such that it would be most unlikely that a healthy person could make a perceptual 'error'. We might suspect the person of insanity or dishonesty, but if neither of these forces could be shown to be at work, we might have to conclude that his perception was veridical.

The concept 'UFO' includes not only the potential for human experience, but also UFO interaction with the non-human physical environment. Photographs, physical traces left on the ground (indentations, broken tree limbs), and blips on a radar screen can also be interpreted as manifestations of UFO activity. Consider the following conversation between the author and a military radar operator:

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> Author: Do you ever have experience with UFOs?
> Operator: Sure, lots of times.
> Author: What do you mean?
> Operator: Well, see we'll get this UFO on the screen. I look at the guy next to me, and we don't say nothing. Then we look at the supervisor, and he looks at us. He knows it's a UFO, too. But he doesn't say nothing. We just don't talk about that stuff.

This interpretation of certain manifestations on a radar screen as UFO activity is a transmissible concept. Ambiguous stimuli which before received a different interpretation (radar 'angels' for instance) are now interpreted as UFOs. The concept is likely to spread to the degree that it helps make sense of otherwise puzzling experiences, and to the extent that it makes perception of ambiguous stimuli more interesting.

In this sense, UFO experiences are contagious. One person's perception of a UFO is not independent of the reports of others. One indication of the willingness of the public to 'see' UFOs is the large number of natural objects and phenomena which subsequent investigation has shown to be the stimuli in something like 80 percent of cases reported to the United States Air Force.[51] This supports the assertion that many stimuli which would have been perceived in another way are now being perceived as UFOs.

THE REPORTING OF EXPERIENCES

We can analytically distinguish two aspects of the social intelligence system, although it is sometimes difficult to distinguish them in practice. The first is reporting, the act of publicly making witness, of entering a claim that one has had an anomalous experience. A 'report' in this sense does not include communications to one's primary group, but includes only those claims made to some public agency or authority, such as the military, the police, the press, and occasionally scientists. The second aspect of the intelligence process is what happens after a report has been made: the social data-processing, as it were, of the information. Seldom is the initial report made to the person or persons who are seen as being capable of acting as 'expert' about the occurrence; at least one, and probably more, intermediary links will exist between the anomaly experiencer and the expert who decides on the nature of the occurrence. In fact, it might be more realistic to view the entire communication chain as a series of decision-makers,

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each of whom has to decide whether or not to pass the information on, and if so, with what evaluation. Needless to say, the report will probably be altered in major and minor ways during the transmission process. By the time such claims come into the hands of scientists, they may have to survive a considerable amount of such social data-processing.

The primary material on which the social intelligence system has to work, the reports of individuals' experiences, will exist only if the experiencer feels that making public witness of his experience is worthwhile. What goes into the decision to report is a complex mixture of individual and social motives. Reporting is an uncertain business, and involves considerable risks to the reporter. At the very least there is the everpresent possibility of ridicule, of having one's experience discounted. But there are also stronger sanctions, severe enough at times to force a change of job or residential location.[52] Uncertainty as to how the report will be received perhaps accounts for the fact that in a majority of cases, no report is made. The University of Colorado UFO Project found that only thirteen percent of the persons who stated that they had had a UFO experience had reported it in a public way.[53]

Experiencers who do make reports are often ignorant of these possible negative consequences or have strong reasons for running the risks anyway. Experiencers whose reports reached the files of the University of Colorado Project indicated that for them, the two strongest motivations were 1) the feeling that strange objects should be reported, and 2) 'I would want to know what it was'.[54] Given that the first motivation, mentioned by forty-three percent of the reporters, could be seen as involving a sense of civic duty, one can well sense the bitterness and frustration that reporters feel when they are labelled liars or mentally ill.[55] The author's strong personal impression, however, is that the second motive is by far the more powerful. The experiencer desires to 'square' his experience with society in some way, to be made to feel that his experience is explainable in 'rational' terms, or perhaps to convince society that his experience was real and must be taken account of.

The individual's primary group may play a crucial role in assigning meaning to his experiences. In some cases, the meaning given to the experience by the primary group may determine whether a report is made or not. Yet it is sometimes difficult to convince one's primary group that one has had a UFO experience, since the same scepticism that the individual is likely to meet with the authorities may exist

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in the primary group as well. In particular, if the individual was alone when he had the experience, even close kin may not believe his claim.[56] This, of course, may provide a reason for reporting: the individual may try to legitimize his experience through the wider society, in an effort to convince his primary group of the experience's reality.[57]

In some cases where there is no formal report made, accounts of the experience circulate informally among colleague or professional groups. Those from one's own occupational group may be easier to credit with veridical experiences than those outside it,[58] and the combination of this credibility and high contact makes it likely that accounts will circulate more easily within an occupational sub-culture than between such sub-cultures. Yet in other cases professional norms may impede transmissions of one's anomaly experiences to one's colleagues.

This reluctance is particularly marked in the scientific community, where there is a strong emphasis on collegial recognition as a social reward.[59] Schwarz, a psychiatrist, notes that he interviewed a physicist who is now professor and chairman of a university department. Although this person had experienced a UFO sighting at close range which he credited with having had a significant influence on his life, few of his colleagues were aware that he had had such an experience.[60] Nor would he allow his name to be used in Schwarz's writings. In my own interviews with twenty-four physicists and chemists in a university setting, I came across one case in which an apparently prominent physicist had experienced what would be called, in the jargon of UFO research, a 'cloud-cigar'. He had not publicized the fact, however, and had sworn his friends to secrecy. Thus, many reports – how many, it is difficult to tell – by scientists are kept not only from the public but from their colleagues at large. And it appears to be the case that scientific journals are very reluctant to accept articles dealing with UFOs, even when these articles are written by astronomers.[61] The scientific community may thus not be aware of many of the UFO experiences of its own members.

The reluctance to report may extend even to the intentional concealment of research projects on UFOs carried out by scientists and others. Ruppelt mentions two cases of such concealment, both dealing with the relation of UFOs to exceptionally high atmospheric radiation. In one case a group of scientists at an Atomic Energy Commission laboratory had noticed that large increases in radiation tended to be associated with local UFO sightings. Some years later

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they set up a recording apparatus on a local mountain, and found that in the one case in which a UFO had been seen near the mountain their recording apparatus showed a sizeable increase in radiation level.[62] In the second case a military installation found consistently that its radiation monitoring equipment tended to show high radiation in areas where UFOs had been seen.[63] In both cases no official report of these activities was made.

BEHAVIOUR OF OFFICIAL AGENCIES

So far we have been largely concerned with those who have experiences with and report UFOs. Clearly one parameter of reporting, though, is the expected reaction of those to whom the report will be made. In the United States the news media and the Air Force are the most important agencies in this connection. Let us examine the role of each in turn.

The role of the news media is the most obvious in influencing the reporting of UFO experiences. The treatment of some individuals' experiences in a positive manner is likely to elicit reports from those who would be apprehensive about making claims by themselves. Even negative treatment of experiences will elicit some reports, since it is apparent that at least some others are having similar experiences. Failure to mention UFO experiences, however, will discourage reporting, as well as yielding the impression that experiences are not occurring.

A point that is often advanced in favour of the 'contagion' hypothesis is that reports seem to occur in batches or 'flaps'. Earlier we indicated that this may be an artifact of media behaviour, rather than an actual increase in the number of experiences. What usually happens is a kind of 'report release' phenomenon: the publication of a single report prompts the release of many more. The real question posed by this phenomenon is whether the propensity to have a UFO experience changes, or whether what changes is the propensity to report. One indication of which is happening is the alleged dates of the 'released' experiences. If these pre-date the 'trigger' report, it is difficult to see how they could have been stimulated by it.[64] In some cases, the reports are years or even decades old.

The first report of UFOs which raised the possibility that these anomalous aerial phenomena might be spaceships from another world occurred on 24 June 1947. On that date Kenneth Arnold, an American

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businessman flying his own private plane, reported sighting nine discs near Mount Rainier, Washington. The phrase 'flying saucer' was coined to describe what Arnold saw. Yet Bloecher's study of the 1947 'flap' shows about three dozen experiences taking place before Arnold's 'sighting' was publicized which were not reported until afterwards.[65] In one case, which took place on 19 May 1947, seven employees of the Pike's Peak Railway claimed an experience with a 'daylight disc'.[66] Reports of experiences which pre-dated Arnold's experience were thus released by the publication of his report. These experiences do not seem to have been stimulated by Arnold's. However, immediately following Arnold's sighting, dozens of other experiences took place: one cannot so easily rule out perceptual contagion in these cases. These two aspects of 'flaps' – report release and perceptual contagion – combine to bring to public attention a large mass of reports at one time. At other times, UFO experiences may well be occurring, but they may go unreported in the press. Thus the impression one derives from the press may bear only a distorted relation to what is in fact occurring.[67] UFO flaps in this way resemble 'crime waves' which equally tend to be a creation of the press.

In many respects, UFO reporting is strongly conditioned by social expectations. If the press prints UFO reports, many more experiences are reported. If it does not print UFO reports, fewer reports are made. A newspaper which never prints UFO reports will probably get very few. In this way, the expectations and policies of the press influence the information it gets, and the attitudes of the press toward UFOs become reinforced through the effects of its own actions.

The intelligence operations of the United States Air Force in regard to UFOs suffer from similar problems.[68] The reactions of the Air Force to reports it receives determines to a large extent what reports it will get. This problem is particularly acute in relation to agencies and organizations within the government which are in a position to have repeated experiences with UFOs. The reaction they receive to the first reports they make will often determine if they make any more reports. Ruppelt indicates in several places how important this feedback can be in influencing the transmission or non-transmission of reports.[69]

A major problem with reports from agencies is the different social contexts in which reporters and evaluators exist. Those making the reports are 'locals'. They are on the spot, in the field, where the experiences actually take place. Believing themselves familiar with their own territory and equipment, they feel confident that they are

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able to discriminate anomalous from non-anomalous events. Those who eventually evaluate the reports exist in a different context, however, often in political capitals or headquarters far from the scene of action. They are 'centrals', existing in the centre of communication networks whose transmissions they must evaluate in terms of 'the big picture'. When locals attempt to report anomalous events to the centrals, trouble is almost necessarily bound to ensue.

The communications from locals to centrals tend to arrive in written form, often with contextual facts and emotional ambiance extracted from them; in any case, there is nothing to require the centrals to read the reports in their entirety. The centrals, reading these reports of anomaly experiences, recognize immediately the unacceptable character of such transmissions. They must then account for the locals' behaviour. Are they joking? Then the joke is returned; it is suggested, for instance, that the locals have been drinking too much.[70] Are they sincere? Then there must be something wrong with the locals' equipment, so they are advised about certain elementary types of errors they might not have taken into account.[71] The effect of these responses is almost always that the reports stop coming, a result that the centrals do not seek to avoid.

In other cases, ordinary citizens have submitted reports to local Air Force bases. In these cases, the local officers have not been involved in the sightings themselves, and have little commitment to transmit the sightings. To avoid unpleasant suggestions from their centrals, they will tailor their information transmissions to match the expectations of their superiors.

> Air Force officers are human, and therefore interpret their duty quite differently. Some went to great lengths not to submit a report. Others took special delight in submitting all of the 'easy' ones out of a zealous loyalty to their service, because the more 'identifieds' they turn in, the higher would be the overall percentage of UFO reports explained.[72]

The centrals, too, have their own higher echelons, whom they in turn must take into consideration:

> The people on the UFO project began to think maybe the brass didn't consider them too sharp so they tried a new hypothesis: UFOs don't exist. In no time they found that this was easier to prove and it got recognition. Before, if an especially interesting UFO report came in and the Pentagon wanted an answer, all they'd get was an 'It could be real but we can't prove it'. Now such a request got a quick, snappy, 'It was a balloon', and feathers were stuck in caps from ATIC up to the Pentagon. Everybody felt fine.[73]

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Because of the often close dependence of agency behaviour on the perceived wishes of the higher echelons, the information which reaches the latter may vary in a manner only partially related to external events, at least as such events reach the lower echelons.

Not all agency personnel, of course, act in this manner. Some persist in forwarding reports of unexplained UFO sightings in spite of the sentiments of their superiors. When official channels bog down, informal channels are often used for communication. The higher echelons are not necessarily unanimous, and those among the higher echelons who take an interest in UFO experiences may find sympathetic lower officers who will surreptitiously forward reports, although this will sometimes be done only on a face-to-face basis. Here again the informal communication that takes place among colleague groups is often the main channel along which much information travels and discussion takes place.

> For several months the belief that Project Blue Book was taking a negative attitude and the possibility that UFOs were interplanetary spaceships had been growing in the Pentagon, but *these ideas were usually discussed only in the privacy of offices with doors that would close tight.*[74] (emphasis supplied)

It nonetheless appears true, at least in the period 1947-53, that evidence by and large was looked into, reported, or destroyed according to what it was felt the higher echelons of the Air Force desired.[75] This was also true of the orientation of Project Blue Book, which had been set up by the Air Force to investigate UFO reports. The sensitivity of Project Blue Book officers to the desires of high Air Force officials was very strong.[76]

The Air Force was not content with discouraging the transmission of information about UFO experiences within its own ranks. Periodically, it issued public statements pooh-poohing UFOs which, printed in the press, helped discourage reporting. The so-called Robertson Panel, a group of physical scientists who were called by the Air Force to evaluate the evidence for UFOs in 1953, recommended a public debunking campaign to take the 'mystery' out of UFOs.[77] The intention of the Robertson Panel was to discourage the 'poor' quality reports so that there would be more time to process 'good' quality reports which they felt would represent military actions by the Soviet Union. It is possible, on the other hand, that what would have resulted had their recommendations been taken seriously was a *decreased propensity to report*, which would affect 'good' as well

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as 'poor' reports. An Air Force 'public education' campaign in 1949, although admittedly less elaborate than the one proposed by the Robertson Panel, hardly succeeded in quashing public interest.[78] The campaign itself may have served to stimulate public interest, since it was obvious to many observers that the Air Force was being less than candid. This may be one of the 'ironies' to which Jones[79] has referred: the process of concealment itself arouses interest in what is being concealed.

Something of the relationship between official knowledge and the extent of UFO experiences can be gained by considering how few experiences ever end up in official files. Of the 3.75 million (estimated) people who claimed seeing UFOs previous to 1968, the University of Colorado project found that 13 percent (or about 490,000) had reported their sightings.[80] Between 1950 and 1969, the Air Force claimed to have received about 12,000 reports.[81] This would mean that there would be one report in Air Force files for every 312 persons who claimed a UFO experience.[82]

Nor are the reports which reach Air Force files necessarily a random sample. Ruppelt, while director of Project Blue Book, once found out about a very important sighting while riding on a plane with a man who had no idea who Ruppelt was; Ruppelt was the first and apparently the only person he had confided in, probably because he was a complete stranger.[83] This sighting, which correlated with another previously uncorroborated sighting, reached Ruppelt by coincidence. How many other important experiences are not so serendipitously communicated? One does not know. It is clear, though, that much that is important comes to light only after intensive search or completely by accident. Reporting is thus a haphazard process.

AMATEUR UFO INVESTIGATION

A third portion of the social intelligence system is the transmission of reports by amateur UFO investigators. With virtually the opposite bias from that of the Air Force, tens of thousands of private individuals have investigated UFO experiences. Often these individuals have belonged to large voluntary organizations like the National Investigations Committee on Aerial Phenomena,[84] but many have also pursued investigations on their own. The quality of these investigations has varied enormously, from the most casual to prolonged researches which have involved several hundred man-hours

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of patient detective work. In addition to field investigations, these amateurs have served as the conduit for 'leaks' from the military and have searched historical records for parallel occurrences in the past. With the intensity of the passionate hobbyist, amateur investigators interview UFO experiencers, search for physical traces of UFO 'landings', write reports, exchange them, collect old UFO magazines and books, discuss their investigations with each other, hold congresses, publish journals and occasionally write books.

UFO researchers form a very large and diffuse intellectual community.[85] To a certain extent, they share a common literature and a common set of categories for describing UFO phenomena and different approaches to them. But beyond a recognition of a shared interest in the same subject, the commonality ends. There are wide divergences in formal education, ranging from those without high school diplomas to those with graduate degrees. A small number of scientists with doctorates are involved, almost all of whom pursue UFO research as an avocation. Organizational feuds are common, particularly between the larger organizations, many of which have hundreds of members and publish their own newsletters or journals. While some organizations emphasize their 'scientific' orientation, others pursue UFO research only as an adjunct to an essentially religious orientation. Included in the community are a small number of researchers who do not believe that UFOs exist, and investigate cases only to expose their weaknesses. Even those who believe that UFOs exist, however, are often unable to agree on the phenomenon's nature and its boundaries.

The social intelligence functions of this community are considerable. It publishes large numbers of books, pamphlets, and journals, many of which have mass-market appeal.[86] The number of periodical publications is large enough so that no researcher would seriously consider trying to read all of them. This literature of course varies considerably in quality, and many of the most popular works are uncritical re-hashes of material from other publications. A number of books and journals, however, contain the results of original researches, some quite carefully done[87] and still others contain large catalogues of experiences systematically arranged.[88] Data from some of these catalogues have already been analyzed to produce some interesting statistical results.[89] One of the most useful effects of this literature is its critique of official pronouncements, especially those of the Air Force.[90] But the community contains a fair amount of self-critique as well, especially from the researchers who do not

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believe UFOs exist.[91] These internal critiques have been an important stimulus for more sophisticated research within the community.

UFO researchers and their organizations function further as an interest group which has lobbied the American government in favour of governmental UFO investigations. Pressure from private UFO research organizations provoked the expensive University of Colorado project, which nonetheless produced the negative Condon Report.[92] They have also served as liaisons between UFO experiencers and interested scientists, finding persons who claimed UFO experiences and arranging for scientists to interview them. Scientists have reciprocated by acting as consultants and speakers for UFO congresses. In this way scientists have participated, if with considerable reservations, in the culture of the UFO research community, becoming conversant with private UFO literature and being able to study UFO experiencers at first-hand. In a more subtle way, private UFO researchers have served as a consensual support and a community of legitimation for scientists interested in UFO phenomena. This support has helped the involved scientists to continue in what, from the standpoint of the larger scientific community, has been a deviant line of conduct.

THE INFLUENCE OF SOCIAL INTELLIGENCE

Having spent some time surveying the more important components of the system of social intelligence regarding UFOs, we can turn our attention to the effect that these systems' transmissions have had. We can now pose the question: what influence on scientific opinion and research has social intelligence had? By and large, it has had very little, but there are significant exceptions. Let us consider some of the reasons.

Within the astronomical community and the scientific community in general, the relatively great distance of the stars from the solar system – the nearest, Alpha Centauri, is four light years away – has seemed to prohibit space travel as a practical form of interstellar communication.[93] Attention has been focussed instead on detection of electromagnetic signals from extraterrestrial intelligences.[94] Whereas the astronomical community can readily envisage spending large sums of money on efforts to detect radio signals from other star systems,[95] a similar enthusiasm is not evident where UFO research is concerned.[96] Reports of what seem to be extraterrestrial spacecraft must confront

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this presumption of the low a priori probability of such spacecraft reaching the Earth.[97]

Other features of UFO reports reaching scientists through the social intelligence system have also convinced them that the evidence does not bear a closer examination. Many scientists expect that extraterrestrial life reaching the Earth would behave in 'rational' and 'predictable' ways that UFOs are not reported to exhibit.[98] The diversity of reported UFO shapes also seems an argument against their reality, since it is assumed that if UFOs were real, there would be some consistent feature that one could use to distinguish the authentic reports from the inauthentic.[99] Finally, there seem to be no UFOs or fragments of them available for study.[100] Inaccessibility thus combines with improbability to render UFOs an unpromising area for research.

The Air Force and the mass media have communicated enough about UFO experiences to convince most of the scientific community that the pattern one finds is not the pattern one would expect if actual extraterrestrial life were involved. Any specific claim of a UFO event, or any study of UFOs which cannot satisfy these criteria, can therefore safely be ignored, since it is evident that whatever the honesty or qualifications of the reporter or the ability of the researcher, UFOs cannot be extraterrestrial spaceships. It is easier to explain the events as being due to routine causes. Like Hume, many scientists seem to feel that:

> The knavery and folly of men are such common phenomena, that I would rather believe the most extraordinary events to arise from their concurrence, than admit of so signal a violation of the laws of nature.[101]

More recently, Polanyi has offered a persuasive rationale for the dismissal of experimental results that violate our current scientific convictions.[102] Such results, according to Polanyi, usually turn out to be caused by errors which may be difficult to detect. If all such results were scrupulously investigated or disputed, time which could be spent in more productive ways would be wasted, and there would be a mis-allocation of scientific effort. Better to dismiss such results out of hand, Polyani argues, in the hope that the very few which are significant will come to our attention in other ways. If such procedures can be recommended with the experimental results of fellow scientists, is not a stronger approach justified with the uncontrolled experiences of non-scientists? Why should a researcher devote effort to an area

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so unlikely to pay off, and one in which he will, in addition, earn the scorn of his colleagues?[103]

One astronomer has argued that concern about ridicule is not an issue in scientists' deciding not to do research on UFOs.[104] He further remarks, however, that a scientist

> selects his area of investigation not because of pressures but because he sees the possibility of making some significant scientific advance. . . . If his choice later proves wrong, he will feel very badly and try to sharpen his criteria before he sets out again.[105]

But a 'wrong choice' may do more than cause bad feelings; it may jeopardize a career.[106] Nor is the 'promise' held by a particular research area independent of others' reactions to it. How successful one is in pursuing a particular line of research may depend on help from one's university, outside funding agencies, and professional journals. Furthermore, other decisions about the researcher's funding, promotion, and tenure may be made before the research has a chance to pay off. Colleagues' attitudes towards one's research area may well be a 'pressure' which is very effective in influencing research choices, at least to the extent of steering the scientist away from certain lines of inquiry.

When the environmental forces are so strong against doing research on UFOs, the scientists who investigate experiences, publish statistical analyses, and advocate more such research require explanation. In what ways are the scientists who investigate UFOs different from other scientists?

The dozen or so scientists involved continuously in UFO research are not a large enough sample to permit generalization about such differences. It is significant, however, how they became interested in the UFO phenomenon. In no case, to my knowledge, did an intellectual interest in extraterrestrial life lead directly to an interest in UFOs. Exobiologists and astronomers interested in interstellar communication are seldom interested in UFOs.[107] What one finds instead is that scientists who now do UFO research were drawn into it for idiosyncratic, almost accidental reasons. In one case, the researcher was hired by the government to investigate UFO cases, and later became independently interested. In another case, an organization in the amateur UFO research community contacted the researcher after he published an article on the Martian soil. In another case, a UFO experience by the researcher led to an investigation of other UFO cases. In still another instance, contact with a fellow

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scientist who was a UFO researcher led another into his own programme of UFO research. The UFO literature was instrumental in these cases only after the researcher's interest had been aroused through contact with cases or with members of the UFO research community.

Summing up, social intelligence as pure information has only convinced scientists that UFOs are little worth studying. The scientists who were stimulated to move into UFO research were motivated by personal contacts with UFO research and UFO researchers. Even the elaborate compilations of cases by non-scientist UFO researchers were persuasive only after personal contacts or experience had created a strong interest. Of course, the growth of the amateur UFO community has been immensely aided by its own literature, and in this sense, the literature has indirectly contributed to scientists' interest in UFOs.

CONCLUSION

What scientists believe about an anomaly like UFOs depends in an important way upon information which originates outside the scientific community. But scientific beliefs are also determined by current scientific and engineering doctrine. When reports reach scientists that people have seen what seem to be extraterrestrial spaceships, this information must confront the belief that interstellar travel is impossible or at least impractical. The evidence must be very strong before scientists will take seriously events which contradict a principle which seems so well supported. Furthermore, the evidence must fall into a pattern which scientists can recognize as the 'logical' one for extraterrestrial visitation to follow. Whatever one might feel about how strong the evidence for UFOs is, the evidence which filtered upwards to scientists about the UFO experiences of their fellow men has not proved convincing, nor does it follow this 'logical' pattern.

What we have attempted here is to sketch the workings of the social intelligence system which selectively transmits this information about UFO experiences to scientists. Would more scientists believe that UFOs were worthwhile researching if the system worked differently? It is hard to know with any certainty; but if the messages they had received had been different it seems likely that their attitudes toward UFOs would also be different.

In this regard, it is instructive to consider scientists who have

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investigated UFOs personally, as opposed to viewing them through the distal end of the social intelligence system. The reactions are remarkably diverse. One meteorologist described the UFO phenomenon as 'the greatest scientific problem of our times'.[108] The conclusion of the pessimistic Condon Report, however, stated that 'Further extensive study of UFOs probably cannot be justified in the expectation that science will be advanced thereby'.[109] A sizeable number of scientists who have researched UFOs could be found to support either one of these two points of view. In any case, this divergence suggests that resolving the controversy is not simply a matter of 'taking a look at the evidence', as some UFO advocates have suggested.

Perhaps in time the studies conducted by the UFO advocates in the scientific community will convince fellow scientists that UFOs are real. Or perhaps, if no dramatic evidence like the l'Aigle fall becomes available, the UFO controversy will fade from sight, as the sea-serpent controversy did earlier.[110] Or perhaps it will continue on in limbo, as has the controversy over ball lightning.[111]

The processes involved in social intelligence about UFOs are in many ways typical of the flow of information about similar anomalous events, like the Loch Ness Monster. In making decisions about these other anomalies on the basis of social intelligence, the scientist faces similar problems: the non-random nature of the sample, the haphazard nature of the reporting process, the concealment of experiences by technically trained persons, and the general low probability that a single experience will reach him through the available channels. But on the other hand, he may be able to use an amateur research subculture to help him locate experiencers; and it is possible, often through strenuous efforts, to change the parameters of the reporting process.[112] But in any case an understanding of how social intelligence processes about anomalous experiences work is necessary for an evaluation of the reliability and adequacy of the information one gets about UFOs and similar 'impossible' events.

Without this understanding, one is likely to assume that absence of evidence is evidence of absence. John Pringle (1707-82), a Fellow of the Royal Society and later its President, stated in 1760 that it was his belief that meteors never fell to the ground. He stated:

> And here I would venture to affirm, that, after perusing all the accounts I could find of these *phenomena,* I have met with no well-vouched instance of such an event; nor is it to be imagined but that, considering the frequency of such appearances, if these meteors had really fallen, there must have been

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> long ago so strong evidence of the fact, as to leave no room to doubt of it at present.[113]

Pringle was wrong. Meteors do fall to the ground in the form of meteorites, and even in Pringle's time information about a considerable number of falls was available. But either Pringle did not know of it or he did not consider it 'well-vouched'. It would be forty-three years, in fact, before the scientific community would be convinced that the falls were real.

Where anomalies are concerned, then, the question of *how* one knows *what* one knows cannot be ignored.

POSTSCRIPT

Too late to be included in the main body of the text, I have just received a document which modifies some of the conclusions of this paper: P.A. Sturrock, *Report on a Survey of the Membership of the American Astronomical Society Concerning the UFO Problem* (Stanford, Calif.: Institute for Plasma Research of Stanford University, January 1977). This survey, which includes responses from 1,356 members of the AAS, indicated that 53 percent of the respondents felt that the UFO problem 'probably' or 'certainly' deserves scientific study. Seventy-five percent of the respondents indicated that they would like further information on the subject, and of these the overwhelming majority (92 percent) stated that they would prefer to receive their social intelligence in the form of scientific journal articles; getting information in the form of books, lectures, or symposia was much less acceptable. This preference is interesting in view of the extremely low propensity of UFO reports to appear in scientific journals, in strong contrast to other channels of information.

It is also interesting to note that 62 of the respondents (4.6 percent) indicated that they had witnessed or obtained an instrumental record of an event that they could not identify which might be related to the UFO phenomenon. Although there was only a small tendency to attribute these experiences to alien devices (average psychological probability that stimulus was alien device = 5 percent), the number of these experiences is still intriguing. It is, however, less than half of the percentage mentioned earlier in this paper; this perhaps represents the results of too small a sample, and perhaps a lack of randomness, in the first survey.

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NOTES

1. M. Truzzi, 'The Occult Revival as Popular Culture: Some Random Reflections on the Old and Nouveau Witch', Sociological Quarterly, Vol.13 (Winter 1972), 16-36.

2. See. A. deGrazia (ed.), The Velikovsky Affair (London: Sidgwick and Jackson, 1966).

3. For the text of one of these counter-attacks, see B.J. Bok et al., 'Objections to Astrology', The Humanist, Vol.35, No.5 (September-October 1975), 4-6. Comments on this statement will be found in succeeding issues of The Humanist and in R. Westrum, 'The Scientist as Critic: Observations on Objections to Astrology', The Zetetic, Vol. 1, No. 1 (Fall-Winter 1976), 34-46; and P. Kurtz and L. Nisbet, 'Are Astronomers and Astrophysicists Qualified to Criticize Astrology?,' ibid., 47-52. Further discussion will be found in the following issue of The Zetetic, in preparation at this time.

4. The arguments of Barry Barnes are very persuasive that it is the deviance of such scientists from community norms which requires explanation, not their 'error' in regard to current scientific beliefs. See S.B. Barnes, 'The Comparison of Belief Systems: Anomaly Versus Falsehood', in R. Horton and R. Finnegan (eds), Modes of Thought (London: Faber and Faber, 1973), 182-98.

5. 'Logic' is used here in its weaker meaning of what makes sense in terms of what is already known.

6. The author is currently at work on a comparative study of social and scientific reactions to anomalies.

7. This paper will not deal with all anomalies, particularly those of a narrow scientific character, but only with the publicized controversial anomalies like those mentioned in the first paragraph.

8. As an example of such an article, consult W. Markowitz, 'The Physics and Metaphysics of Unidentified Flying Objects', Science, Vol. 157 (15 September 1967), 1274-79.

9. F.A. Paneth, The Origin of Meteorites (Oxford: Clarendon Press, 1940), 4.

10. J.B. Biot, Relation d'un Voyage fait dans le Department de l'Orne (Paris: Baudouin, 1803).

11. R. Westrum, 'Sea Serpent Reporting Dynamics', Sociological Review Monographs, special issue on 'Rejected Knowledge' (forthcoming 1978), and 'Boundary Control in Science: The Case of Meteorites', in progress.

12. See B. Heuvelmans, In the Wake of the Sea-Serpents (New York: Hill and Wang, 1968).

13. See H. Strentz, A Survey of Press Coverage of Unidentified Flying Objects (unpublished doctoral dissertation, Department of Journalism, Northwestern University, 1970), 3.

14. D. Menzel, 'Flying Saucers', McGraw-Hill Encyclopedia of Science and Technology (New York: McGraw-Hill, 1960), 363-64.

15. This method of treatment was suggested to me by my former mentor, Duncan McRae.

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16. For an interesting examination of reality negotiation in science, see H.M. Collins, 'The Seven Sexes: A Study in the Sociology of a Phenomenon, or the Replication of Experiments in Physics', Sociology, Vol. 9, No. 2 (May 1975), 205-24.

17. For opposing views on the existence of UFOs, see C. Sagan and T. Page (eds), UFOs: A Scientific Debate (Ithaca, NY: Cornell University Press, 1972).

18. T. Bloecher, Report on the UFO Wave of 1947 (published by the author, 1967).

19. For some suggestive comparisons in the perception of monsters, see A.I. Hallowell, 'Cultural Factors in the Structuralization of Perception', in J.H. Rohrer and M. Sherif (eds), Social Psychology at the Cross-Roads (New York: Harper, 1951), 178-90.

20. University of Colorado, Scientific Study of Unidentified Flying Objects (New York: Bantam, 1968), 577.

21. Ibid., 571.

22. E. Ruppelt, The Report on Unidentified Flying Objects (New York: Ace Books, 1956), 161-62.

23. J.A. Hynek, The UFO Experience (Chicago: Henry Regnery, 1972), 13; see also M. Carrouges, Les Apparitions des Martiens (Paris: Arteme Fayard, 1963), 188-95.

24. J. Bruner, 'On Perceptual Readiness', Psychological Review, Vol. 64 (1957), 123-52.

25. H. Cantril, Invasion from Mars: A Study in the Psychology of Panic (New York: Harper & Row, 1966), 112.

26. Ruppelt, op.cit. note 22, 266.

27. Ibid., 47.

28. J. Fuller, Incident at Exeter (New York: G.P. Putnam's Sons, 1966), 64.

29. University of Colorado, op.cit. note 20, 228.

30. For a fuller treatment, see Hynek, op.cit. note 23.

31. University of Colorado, op.cit. note 20, 212.

32. Ibid., 224.

33. Gallup Poll news release, 29 November 1973.

34. See for instance R.A. Gordon, 'Letters', Science, Vol. 171 (12 March 1971), 957.

35. The following assertions are based on analysis of the 1973 Gallup poll data by myself and my colleague, Ira Wasserman. The data were supplied by the Roper Organization.

36. D.I. Warren, 'Status Inconsistency Theory and Flying Saucer Sightings', Science, Vol. 170 (6 November 1970), 599-603.

37. G.E. Lenski, 'Status Crystallization: A Non-Vertical Dimension of Social Status', American Sociological Review, Vol. 19 (1954), 405-13.

38. D.I. Warren, 'Reported Sighting of UFOs and Individual Social Integration: An Exercise in Classical Sociology', presented at the Symposium of the International Sociological Association Committee on Stratification (Geneva, December 1975).

39. J. Vallée and J. Vallée, Challenge to Science: The UFO Enigma (Chicago: Henry Regnery, 1966), 156-70.

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40. J. Vallée and V.-J. Ballester Olmos, 'The Sociology of the Iberian Landings', Flying Saucer Review, Vol. 18, No. 4 (July-August 1972), 10-12.

41. B. Schwarz, 'UFOs: Dilemma or Delusion?', Medical Times, Vol. 96, No. 10 (October 1968).

42. See for instance the article by L. Grinspoon and A.D. Persky, 'Psychiatry and UFO Reports' in Sagan and Page, op.cit. note 17, 233-46. It appears that neither author has engaged in first-hand research on UFO experiences.

43. D.R. Saunders, 'Some New Lines for UFO Research', Proceedings of Mutual UFO Network Conference (17 June 1972), 130-45.

44. W.S. Robinson, 'Ecological Correlations and the Behavior of Individuals', American Sociological Review, Vol. 15 (June 1950), 351-57.

45. J.A. Hynek, personal communication (Hynek was the astronomer who conducted the poll). See also Ruppelt, op.cit. note 22, 283.

46. R.V. Jones, 'The Natural Philosophy of Flying Saucers', Physics Bulletin, Vol. 19 (1968), 225-30.

47. Vallée and Vallée, op.cit. note 39, 158.

48. See A.C. Kerckhoff and K.W. Back, The June Bug: A Study of Hysterical Contagion (New York: Appleton-Century-Crofts, 1968), 19-44.

49. N.Z. Medalia and O.N. Larsen, 'Diffusion and Belief in a Collective Delusion: The Seattle Windshield Pitting Epidemic', American Sociological Review, Vol. 23 (1958), 180-86.

50. See for instance University of Colorado, op.cit. note 20, 396-407.

51. See the Batelle Memorial Institute study cited in L. Davidson, Flying Saucers: An Analysis of the Air Force Project Blue Book Special Report No.14 (Clarksburg, W. Virginia: Saucerian Publications, 4th edition, 1971), 107.

52. University of Colorado, op.cit. note 20, 225.

53. Ibid., 226.

54. Ibid., 227.

55. One sheriff's deputy the author interviewed received 'get well' cards from his fellow officers after his UFO experience was reported.

56. Fuller, op.cit. note 28, 13, 54, 140, 176; also A. Michel, Flying Saucers and the Straight-Line Mystery (New York: S.G. Phillips, 1958), 43.

57. Some of the difficulty one must face in professing an anomalous experience is demonstrated in J. Coulter, 'Perceptual Accounts and Interpretive Asymmetries', Sociology, Vol. 9, No. 3 (September 1975), 385-96.

58. For instance, airline pilots tend to believe other airline pilots (Ruppelt, op.cit. note 22, 108 ff.); generals tend to believe other generals (ibid., 125); radar operators tend to believe other radar operators (ibid., 169). This tendency is probably stronger the more élite the group is.

59. See W. Hagstrom, The Scientific Community (New York: Basic Books, 1965), 9-104.

60. B. Schwarz, 'Beauty of the Night', Flying Saucer Review, Vol. 18, No. 4 (July-August 1972), 5-9, 17.

61. University of Colorado, op.cit. note 20, 584.

62. Ruppelt, op.cit. note 22, 264-70.

63. Ibid., 270-71.

64. My colleague, Marcello Truzzi, has suggested that some of these may nonetheless be explained by the hypothesis of 'retrospective hallucination'.

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This hypothesis seems questionable, however, for multiple witness cases. Hoaxes, though, may be responsible for many of these reports.

65. M. Bloecher, op.cit. note 18.

66. Ibid., I-1.

67. For a more complete treatment of the behaviour of the American press toward UFOs, see Strentz, op.cit. note 13.

68. This is apparently a generic problem with intelligence organizations. See H. Wilensky, Organizational Intelligence (New York: Basic Books, 1967).

69. Ruppelt, op.cit. note 22, 146, 159-61, 169-70.

70. Ibid., 99.

71. Ibid., 170.

72. University of Colorado, op.cit. note 20, 22.

73. Ruppelt, op.cit. note 22, 82.

74. Ibid., 196.

75. Ibid., 12, 160, 176, 229.

76. Hynek, op.cit. note 23, 186-87.

77. University of Colorado, op.cit. note 20, 915-16.

78. Ruppelt, op.cit. note 22, 87.

79. R.V. Jones, 'Irony as a Phenomenon in Natural Science and Human Affairs', Chemistry and Industry (13 April 1968), 470-77.

80. University of Colorado, op.cit. note 20, 226.

81. Ibid., 514.

82. This situation is not as bad as it seems, however, since many experiences involved multiple witnesses.

83. Ruppelt, op.cit. note 22, 140-41.

84. For a discussion of a large number of the groups and their ideologies, see Vallée and Vallée, op.cit. note 39, 224-40.

85. The remarks which follow are based on D.M. Jacobs, The UFO Controversy in America (Bloomington, Ind.: Indiana University Press, 1975), and on five years' participant observation in the amateur UFO community. Jacobs' is the best general history of the UFO phenomenon in the United States to appear so far.

86. In recent years the expansion of the literature has been so great that the author has had to abandon his policy of systematically buying all the books published in this area.

87. For instance, see Hynek, op.cit. note 23; F.B. Salisbury, The Utah UFO Display: A Biologist's Report (Old Greenwich, Conn.: Devin Adair, 1974); R.E. Fowler, UFOs: Interplanetary Visitors (Jericho, NY: Exposition Press, 1974).

88. See R.H. Hall (ed.), The UFO Evidence (Washington, DC: National Investigations Committee on Aerial Phenomena, 1964). The Center for UFO Studies in Evanson, Illinois, has begun publishing catalogues of specific types of UFO sightings. So far, catalogues on physical traces and Spanish low-level cases have been published. See also Bloecher, op.cit. note 18.

89. See for instance C. Poher and J. Vallée, 'Basic Patterns in UFO Observations', presented at the 1975 Meeting of the American Institute for Aeronautics and Astronautics at Pasadena, California and published in Flying Saucer Review, Vol. 21, Nos. 3 and 4 (November 1975), 8-13.

90. Hynek, op.cit. note 23, 167-213; D.R. Saunders and R.R. Harkins,

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UFOs?. Yes: Where the Condon Committee Went Wrong (New York: New American Library, 1968); P.A. Sturrock, Evaluation of the Condon Report on the Colorado UFO Project (Stanford, Calif.: Institute for Plasma Research, Stanford University, October 1974).

91. D. Menzel, Flying Saucers (Cambridge, Mass.: Harvard University Press, 1953); D.H. Menzel and L.G. Boyd, The World of Flying Saucers (Garden City, NY: Doubleday, 1963); P.J. Klass, UFOs Explained (New York: Random House, 1974).

92. University of Colorado, op.cit. note 20.

93. F. Roach, 'Astronomers' Views on UFOs', in Sagan and Page, op.cit. note 17, 23-33.

94. A.G.W. Cameron (ed.), Interstellar Communication (New York: W.A. Benjamin, 1963); H. Wooster et al., 'Communication with Extraterrestrial Intelligence', IEEE Spectrum, Vol. 3, No. 3 (March 1966), 153-70.

95. Ames Research Center, Project Cyclops: A Design Study of a System for Detecting Extraterrestrial Intelligent Life (Moffett Field, Calif.: Ames Research Center, 1973). The cost estimate of Project Cyclops ranges up to ten billion dollars, according to C. Sagan and F. Drake, 'The Search for Extraterrestrial Intelligence', Scientific American, Vol. 232, No. 5 (May 1975), 80-89.

96. This discrepancy has been noted by S. Friedman, 'UFOlogy and the Search for ET Intelligent Life', Proceedings of the 1973 Symposium of the Mutual UFO Network (Kansas City, 13 June 1973), 40-61.

97. See C. Sagan, 'UFOs: The Extraterrestrial and Other Hypotheses', in Sagan and Page, op.cit. note 17, 265-75.

98. Markowitz, op.cit. note 8, 1277-78.

99. Jones, op.cit. note 46, 229.

100. Ibid.

101. D. Hume, Hume's Enquiries, ed. L.A. Selbe-Bigge (Oxford: Clarendon Press, 2nd edition, 1962), 128.

102. M. Polanyi, 'The Growth of Science in Society', Minerva, Vol. 5, No. 4 (Summer 1967), 533-45.

103. See Hynek, op.cit. note 23, 6-11.

104. G. Kuiper, 'Presentation at Arizona Academy of Sciences Meeting', in University of Colorado, op.cit, note 20, 839-43.

105. Ibid., 840.

106. See a discussion of this point in M.J. Mulkay, G.N. Gilbert and S. Woolgar, 'Problem Areas and Research Networks in Science', Sociology, Vol. 9, No. 2 (May 1975), 187-203. See also the remarks of the astronomer J.A. Hynek in his book with J. Vallée, The Edge of Reality: A Progress Report on Unidentified Flying Objects (Chicago: Henry Regnery, 1975), 193, 199. Hynek indicates in these passages how his concern about his career was reflected in his views and statements about UFOs.

107. Friedman, op.cit. note 96.

108. J.E. McDonald, 'UFOs: Greatest Scientific Problem of Our Times?', presented to the 1967 annual meeting of the American Society of Newspaper Editors (Washington, DC, 22 April 1967).

109. University of Colorado, op.cit. note 20, 1.

110. See Heuvelmans, op.cit. note 12.

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111. S. Singer, The Nature of Ball Lightning (New York: Plenum Press, 1971); E. Garfield, 'When Citation Analysis Strikes Ball Lightning', Current Contents, Vol. 8, No. 20 (17 May 1976), 5-16.

112. One example would be the successful efforts of H.H. Nininger to promote reporting of meteorite falls. Over many years, Nininger carried on an extensive programme of public education in the western United States, encouraging farmers to bring him stones that might be meteorites. These efforts brought to light quite a few meteorites. Interestingly enough, in some cases the stones had been hidden by teenagers who feared their parents might ridicule them for bringing the stones forward. See H.H. Nininger, Find a Falling Star (New York: Paul Eriksson, 1972).

113. J. Pringle, 'Some Remarks upon the Several Accounts of the Fiery Meteor (Which Appeared on Sunday, the 26th of November, 1758) and upon Other Such Bodies', Philosophical Transactions of the Royal Society, Vol. 51, Part I (1760), 259-74. Citation at 272.

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